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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/600,655	06/23/2003	Young-Chol Lee	1293.1667	6144

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EXAMINER

KALIVODA, CHRISTOPHER M

ART UNIT

PAPER NUMBER

2881

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center"><b>Office Action Summary</b></p>	Application No. 10/600,655	Applicant(s) LEE, YOUNG-CHOL	
	Examiner Christopher M. Kalivoda	Art Unit 2881	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>06/23/03</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1- 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tadic-Galeb et al., U.S. Patent 6,172,816, in view of Spaulding et al., U.S. Patent 5,101,458. Regarding independent claims 1, 15 and 42 as claimed, Tadic-Galeb et al. teach an illumination optical system comprising a light source which emits light (col 11, lines 23-26 and Fig 8, ref sign 80B) and a light separation integration device (col 6, lines 38-40 and Fig 8, ref sign 40). In addition, there is a system that modulates the light (col 6, lines 62-66 and Fig 8, ref sign 38) and a projection optical system (Fig 8).

However, the reference is silent with respect to a diffraction device that is provided on at least one incident side of the light separation/integration device wherein the diffraction device diffracts light to adjust an incident angle thereof to a predetermined range.

Spaulding et al. teach the use of a diffraction device which is provided on at least one incident side of a light separation/integration device (Fig 1) wherein the diffraction device diffracts light to adjust an incident angle thereof to a predetermined range.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the light separation/integration device of Tadic-Galeb et al. using the diffractive device as taught by Spaulding et al. and applying it to the light separation/integration device.

The motivation for such an improvement would be to correct any unwanted dispersion of the prism and reduce the size of the optical package (col 4, lines 3-10).

3. Regarding dependent claims 2, 5 – 14, 16, 18-32, 40, 41 and 44, Tadic-Galeb et al. teach the light separation/integration device is an x-cube (col 6, lines 52-55). There is also a light guide between the light source and light separation/integration device (Fig 8, ref sign 82) that is a fiber (col 13, lines 41-44) that conditions the light. There is also a relay lens between the light source and light separation integration device (Fig 8, ref sign 76) and between the light separation/integration device and projection optical system (Fig 8, ref sign 33). In addition, there is an optical path separation device between the light source and light separation/integration device (Fig 8, ref sign 32). While the type of optical path separation device is not a TIR prism, these devices can be substituted and digital micromirrors can be used as the panel.

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The panels are liquid crystal (col 6, lines 62-63) and the optical path separation device is a polarization beam splitter (col 4, lines 39-45).

Furthermore, panels are used to modulate the light (Fig 1, ref sign 38A, 38B, 38C) and the system contains a collecting lens between the glass road and optical separation device (Fig 8, lenses comprising ref sign 16). The image is projected onto a screen (Fig 8, ref sign 36).

4. Regarding dependent claims 3, 4, 17, 33-39 and 43 Spaulding et al. teach the diffraction device can be a diffraction optical element or a holographic optical element (col 3, lines 28-35). The diffraction device can decrease the incident angle of light to reduce light loss since coupling is improved. The diffraction device is directly formed on the incident side or manufactured and separately attached (col 3, lines 28-35) and has power.

### ***Conclusion***

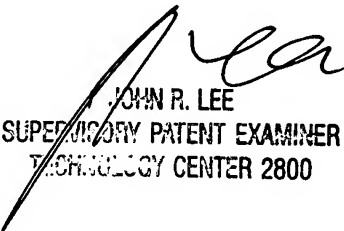
5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Kalivoda whose telephone number is (571) 272-2476. The examiner can normally be reached on Monday - Friday (8:30 - 5:00).

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571) 272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

6. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

cmk

  
JOHN R. LEE  
SUPERVISORY PATENT EXAMINER  
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